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Leto

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(54) **SYSTEMS AND METHODS FOR DETERMINING DATA DEPENDENCY FOR DYNAMIC TILES**

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(22) Filed: **Oct. 29, 2012**

(65) **Prior Publication Data**

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G06F 17/30 (2006.01)

(52) **U.S. Cl.**
CPC ***G06F 17/30371*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

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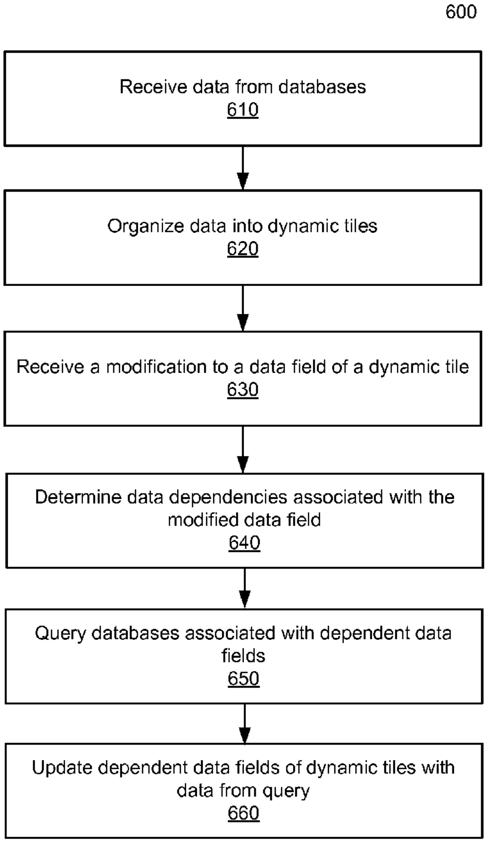
Primary Examiner — Loan T Nguyen

(57) **ABSTRACT**

A system and method to dynamically update a data field are disclosed. In some embodiments, data may be received from a plurality of databases and organized into a plurality of data fields. A first data field may be associated with a single database of the plurality of databases. A user may modify the first data field and the system and method may identify a dependency between the first data field and at least a second data field. The second data field may be updated based on the dependency between the first data field and the second data field.

20 Claims, 9 Drawing Sheets


600
Receive data from databases
610
Organize data into dynamic tiles
620
Receive a modification to a data field of a dynamic tile
630
Determine data dependencies associated with the modified data field
640
Query databases associated with dependent data fields
650
Update dependent data fields of dynamic tiles with data from query
660

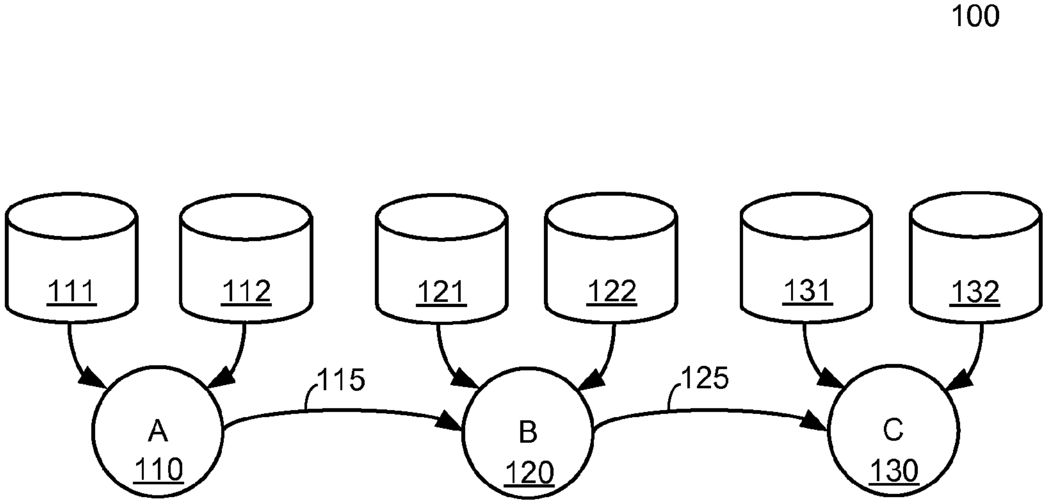


FIG. 1

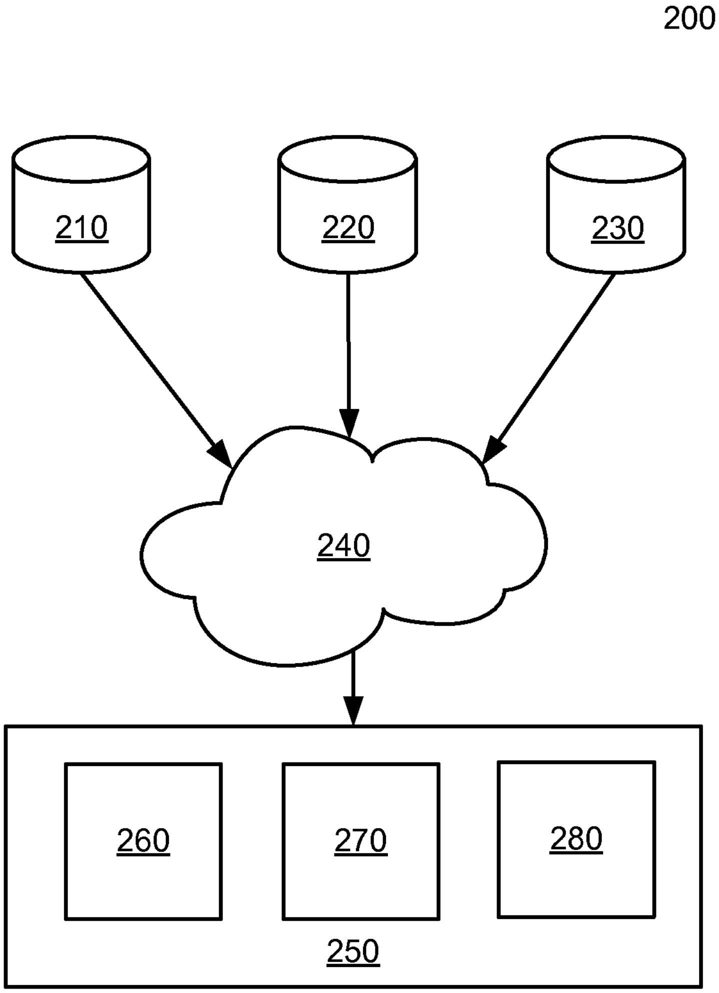


FIG. 2

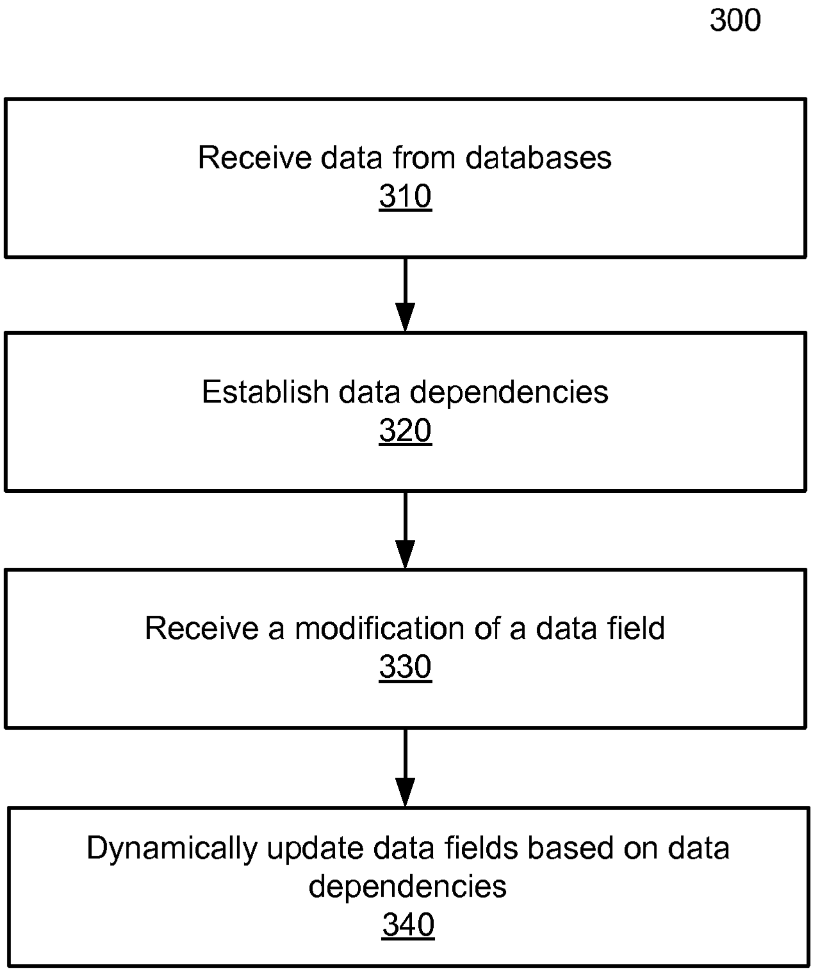
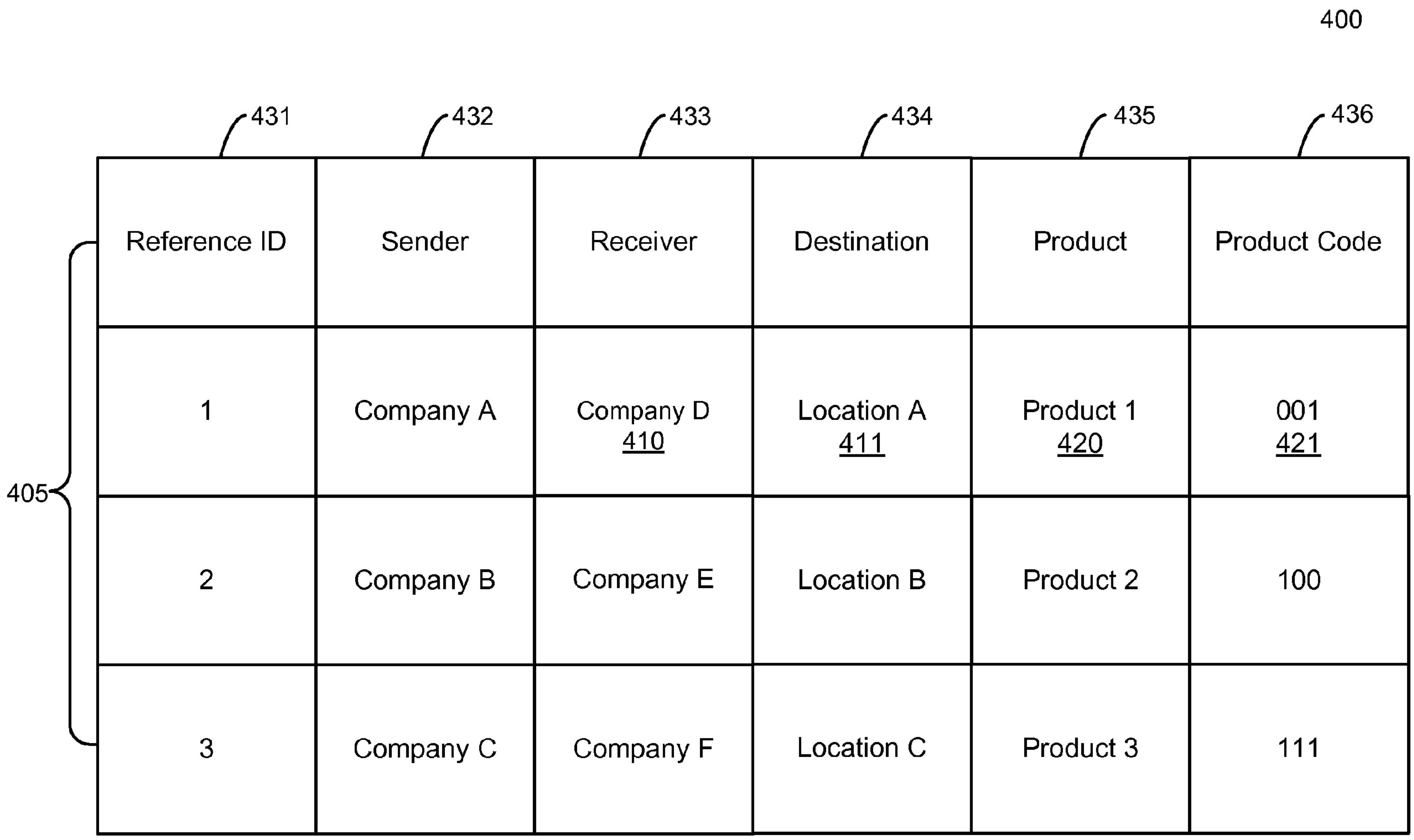

300
Receive data from databases
310
Establish data dependencies
320
Receive a modification of a data field
330
Dynamically update data fields based on data dependencies
340

FIG.3



Reference ID	Sender	Receiver	Destination	Product	Product Code
1	Company A	Company D 410	Location A 411	Product 1 420	001 421
2	Company B	Company E	Location B	Product 2	100
3	Company C	Company F	Location C	Product 3	111

400
431
432
433
434
435
436
405

FIG. 4

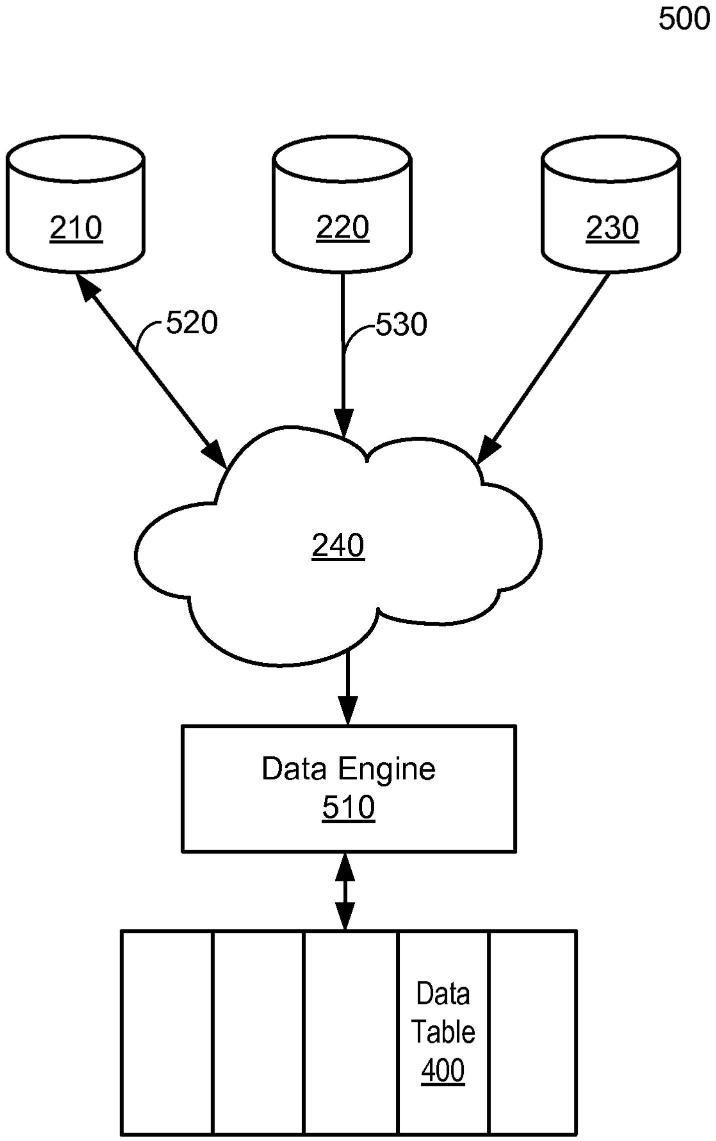


FIG. 5

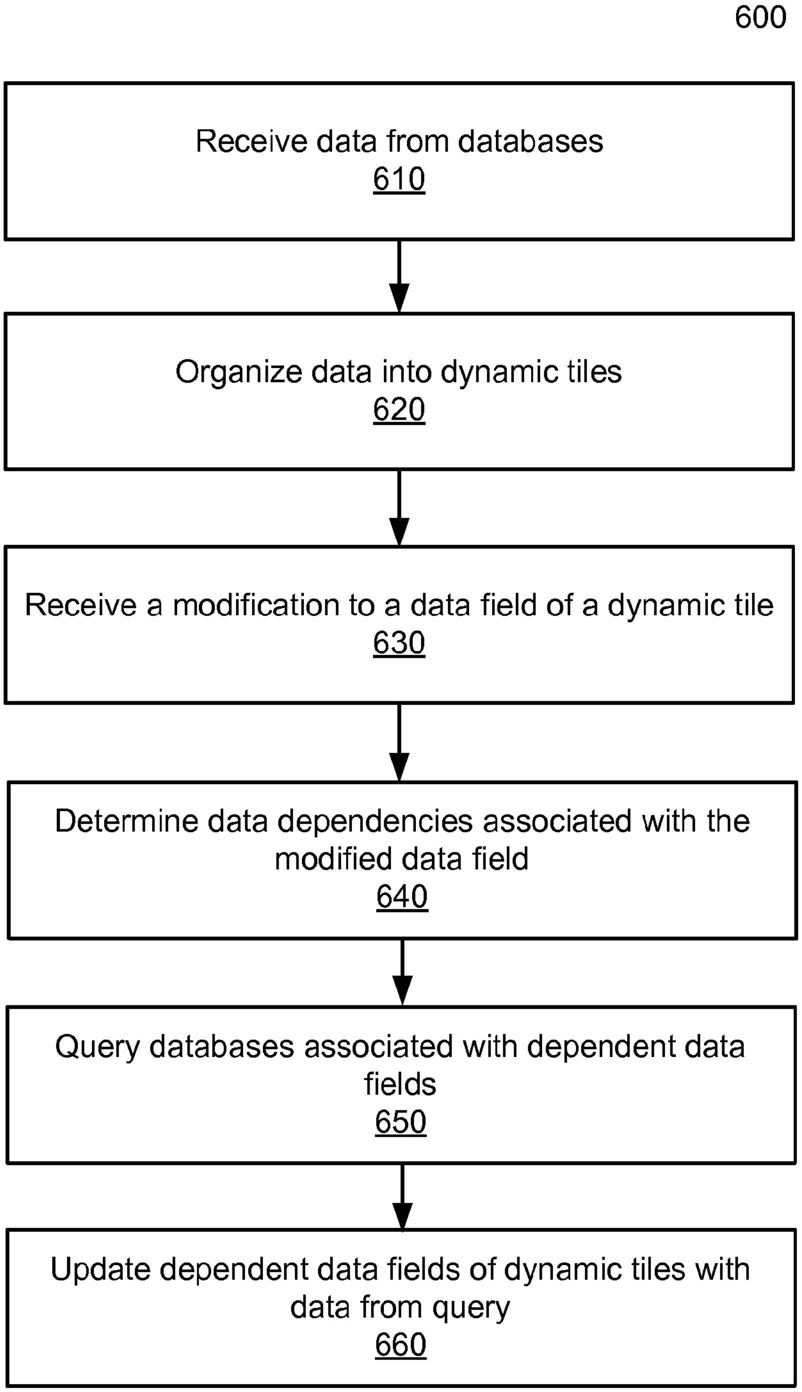
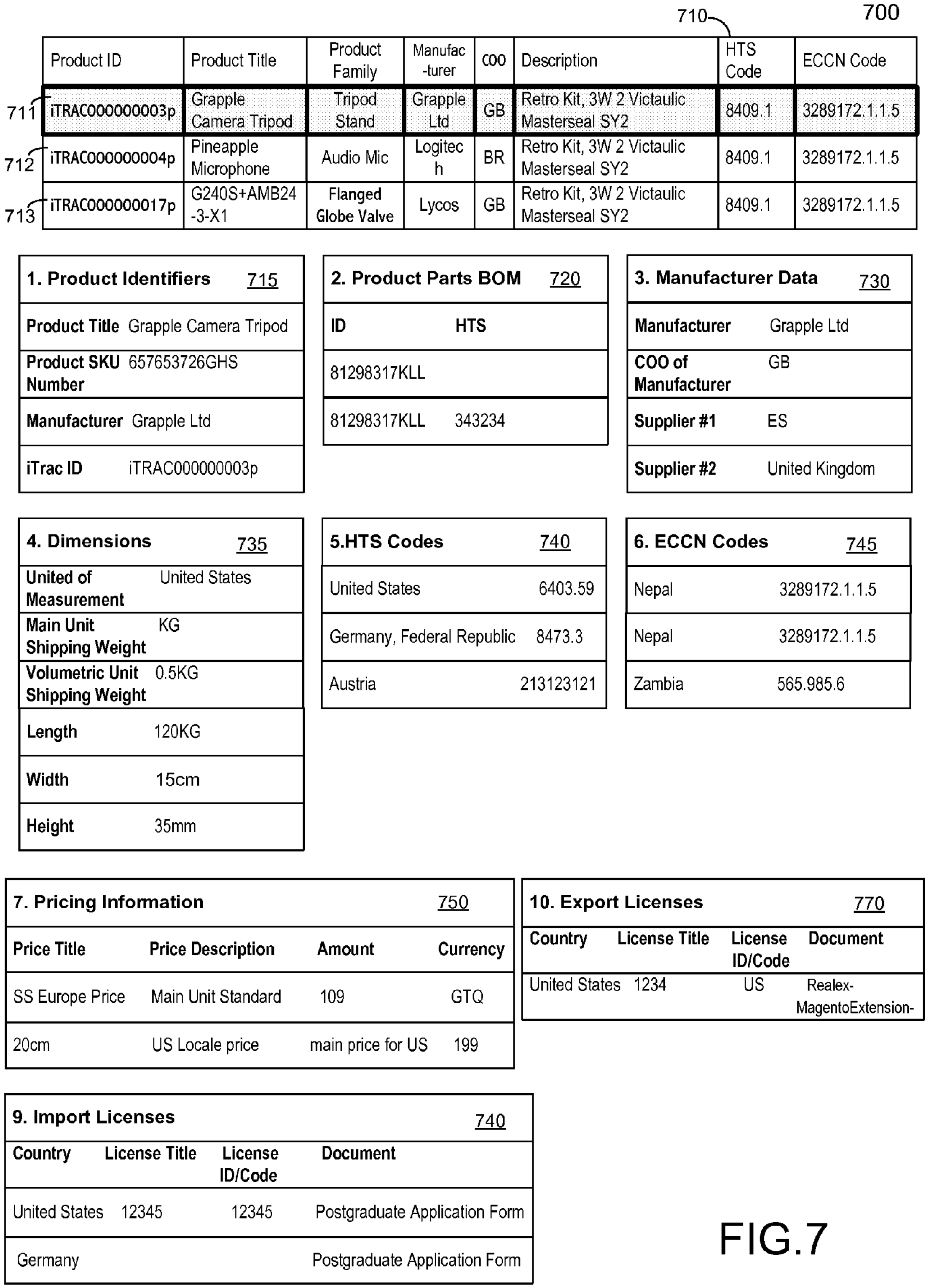

600
Receive data from databases
610
Organize data into dynamic tiles
620
Receive a modification to a data field of a dynamic tile
630
Determine data dependencies associated with the modified data field
640
Query databases associated with dependent data fields
650
Update dependent data fields of dynamic tiles with data from query
660

FIG.6


700
710
711
712
713

Product ID	Product Title	Product Family	Manufac-turer	COO	Description	HTS Code	ECCN Code
iTRAC000000003p	Grapple Camera Tripod	Tripod Stand	Grapple Ltd	GB	Retro Kit, 3W 2 Victaulic Masterseal SY2	8409.1	3289172.1.1.5
iTRAC000000004p	Pineapple Microphone	Audio Mic	Logitech	BR	Retro Kit, 3W 2 Victaulic Masterseal SY2	8409.1	3289172.1.1.5
iTRAC000000017p	G240S+AMB24-3-X1	Flanged Globe Valve	Lycos	GB	Retro Kit, 3W 2 Victaulic Masterseal SY2	8409.1	3289172.1.1.5

1. Product Identifiers 715	
Product Title	Grapple Camera Tripod
Product SKU Number	657653726GHS
Manufacturer	Grapple Ltd
iTrac ID	iTRAC000000003p

2. Product Parts BOM 720	
ID	**HTS**
81298317KLL	
81298317KLL	343234

3. Manufacturer Data 730	
Manufacturer	Grapple Ltd
COO of Manufacturer	GB
Supplier #1	ES
Supplier #2	United Kingdom

4. Dimensions 735	
United of Measurement	United States
Main Unit Shipping Weight	KG
Volumetric Unit Shipping Weight	0.5KG
Length	120KG
Width	15cm
Height	35mm

5.HTS Codes 740	
United States	6403.59
Germany, Federal Republic	8473.3
Austria	213123121

6. ECCN Codes 745	
Nepal	3289172.1.1.5
Nepal	3289172.1.1.5
Zambia	565.985.6

7. Pricing Information 750			
Price Title	**Price Description**	**Amount**	**Currency**
SS Europe Price	Main Unit Standard	109	GTQ
20cm	US Locale price	main price for US	199

10. Export Licenses 770			
Country	**License Title**	**License ID/Code**	**Document**
United States	1234	US	Realex-MagentoExtension-

9. Import Licenses 740			
Country	**License Title**	**License ID/Code**	**Document**
United States	12345	12345	Postgraduate Application Form
Germany			Postgraduate Application Form

FIG.7

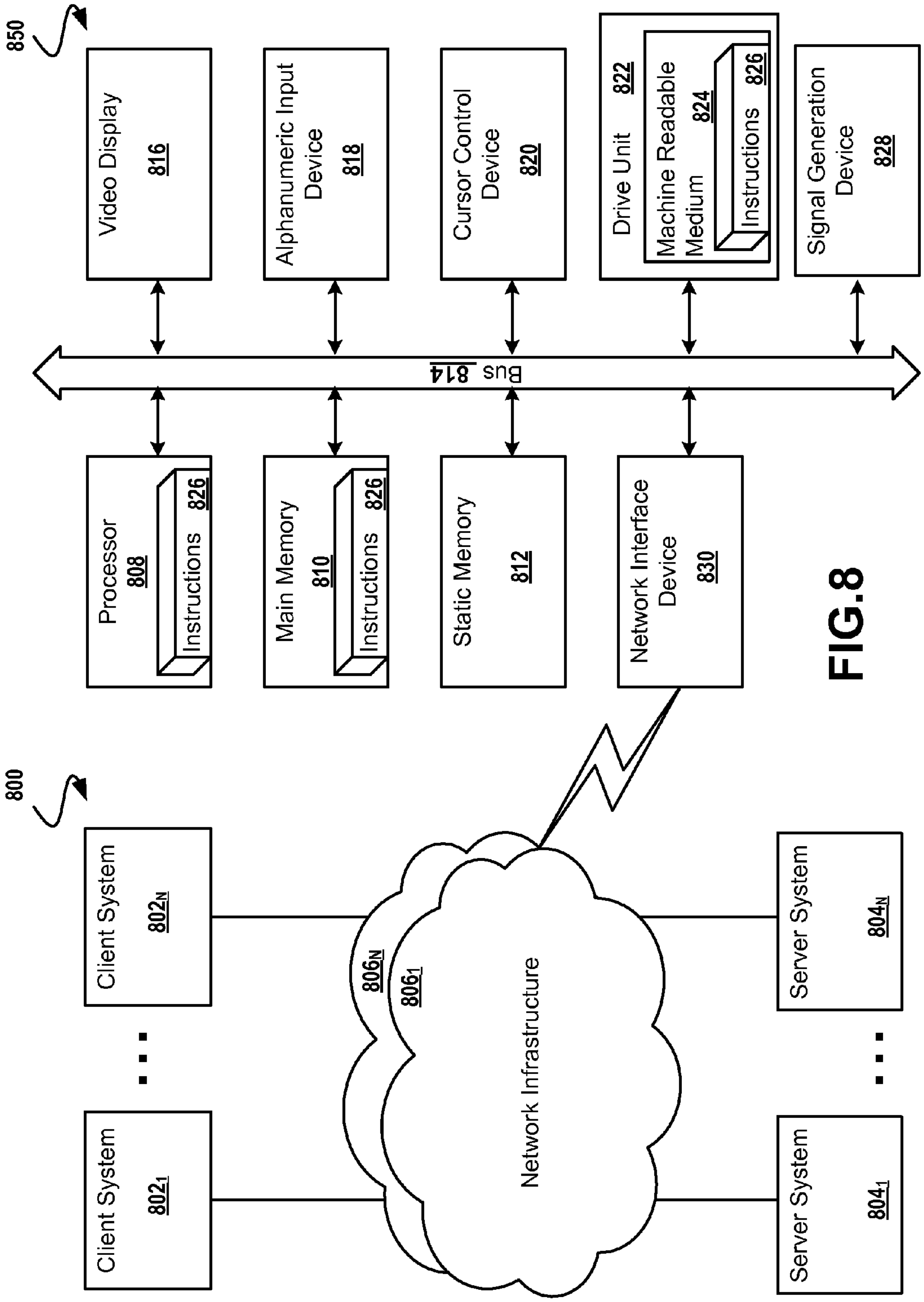

850
Video Display
816
Alphanumeric Input Device
818
Cursor Control Device
820
Drive Unit 822
Machine Readable Medium 824
Instructions 826
Signal Generation Device
828
Bus 814
Processor
808
Instructions 826
Main Memory
810
Instructions 826
Static Memory
812
Network Interface Device
830
800
Client System
802N
Client System
8021
806N
8061
Network Infrastructure
Server System
804N
Server System
8041

FIG.8

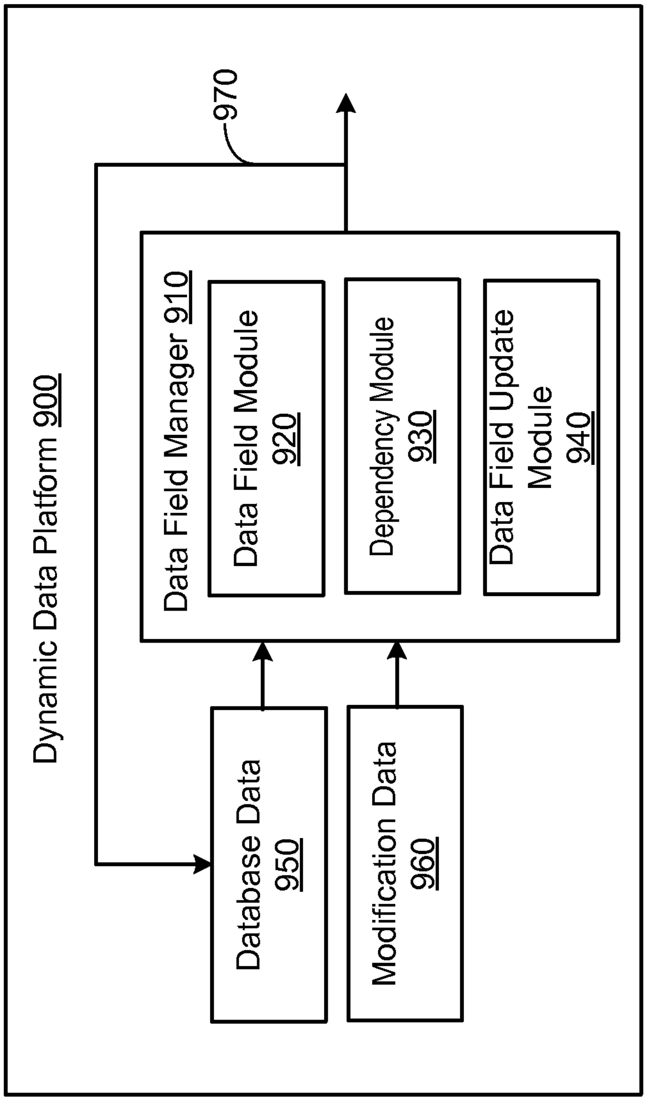

Dynamic Data Platform 900
970
Data Field Manager 910
Data Field Module 920
Dependency Module 930
Data Field Update Module 940
Database Data 950
Modification Data 960

FIG. 9

SYSTEMS AND METHODS FOR DETERMINING DATA DEPENDENCY FOR DYNAMIC TILES

FIELD

The present disclosure relates to systems and methods for data dependency. In some embodiments, the present disclosure relates to systems and methods for determining data dependency for dynamic tiles.

BACKGROUND

Conventional user interfaces for a user platform (e.g., an application program) using a database or an aggregate of databases are typically static. The conventional user platform may receive data from one or more external databases. For example, the conventional user platform may query a plurality of databases and organize data from the queried databases into the database of the user platform. As such, the user interface of the conventional user platform may display data fields comprising information or data queried from a plurality of databases.

Conventional user platforms do not dynamically respond to a change to a data field. As such, conventional user platforms tend to be static. For example, if a user changes a data field in a user interface of the user platform, then other data fields associated with the changed data field may be out of date or incorrect.

As such, it is desirable to develop systems and methods of systems and methods for implementing a dynamic data platform associated with a plurality of databases. For example, systems and methods for determining data dependency for dynamic tiles may address such functionality.

SUMMARY

The present disclosure introduces systems and methods for determining data dependency for dynamic tiles.

The systems or methods may receive data from a plurality of databases. The received data may be organized into a plurality of data fields. In some embodiments, a first data field is associated with a single database of the plurality of databases. The system or method may further receive a modification to the first data field of the plurality of data fields and identify a dependency between the first data field and other data fields of the plurality of data fields. Furthermore, the systems or methods may update a second data field of the plurality of data fields based on the dependency between the first data field and the other data fields. In some embodiments, the second data field is updated if the second data field is dependent upon the first data field.

In some embodiments, the dependency between the first data field and the other data fields of the plurality of data fields comprises an indication that a modification to the first data field requires an updating of at least one data field of the other data fields.

In some embodiments, the systems or methods may further display a plurality of dynamic tiles based on a user selection of a first entry. In the same or alternative embodiments, a first dynamic tile comprises at least one of the data fields and is associated with a first query. The systems or methods may further receive a user selection of a second entry and execute the first query associated with the first dynamic tile in response to the user selection.

In some embodiments, the execution of the first query is performed without a user input of query keywords. The systems or methods may further display the first dynamic tile with at least one updated data field in response to the execution of the first query. In some embodiments, the at least one updated data field is at least partly based on the user selection of the second entry

In some embodiments, the first data field is associated with a first database and the second data field is associated with a second database, the updating of the second data field results in the querying of the second database based on the modification of the first data field.

In some embodiments, the first database and the second database are independent of each other such that the first database and the second database are associated with different locations and different administrators.

In some embodiments, the systems or methods are to facilitate an import or export compliance environment.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features of the disclosure are set forth in the appended claims. However, for purpose of explanation, several embodiments of the disclosure are set forth in the following figures.

FIG. **1** is a block diagram of an example import and export compliance environment in accordance with some embodiments.

FIG. **2** is a block diagram of an example environment for a system and/or method for determining data dependency for dynamic tiles.

FIG. **3** is a flow diagram of an example method for determining data dependency for dynamic tiles in accordance with some embodiments.

FIG. **4** depicts an example data table comprising data fields in accordance with some embodiments of the present disclosure.

FIG. **5** is a block diagram of an example environment using a data engine for determining data dependence for dynamic tiles.

FIG. **6** is a flow diagram illustrating an example method for using data dependencies to query one or more databases in response to a change of a data field in accordance with some embodiments.

FIG. **7** depicts an example user interface comprising dynamic tiles in accordance with some embodiments.

FIG. **8** depicts a diagram illustrating an exemplary computing system for execution of the operations comprising various embodiments of the disclosure.

FIG. **9** depicts an example dynamic data platform system for determining data dependency of dynamic tiles.

DETAILED DESCRIPTION

The systems and methods disclosed herein relate to determining data dependency for dynamic tiles.

In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the present disclosure. However, it will become obvious to those skilled in the art that the present disclosure may be practiced without these specific details. The description and representation herein are the common means used by those experienced or skilled in the art to most effectively convey the substance of their work to others skilled in the art. In other instances, well known methods, procedures, and systems have not been described in detail to avoid unnecessarily obscuring aspects of the present disclosure.

FIG. **1** is a block diagram of an example import and export compliance environment **100** in accordance with some embodiments. In general, the environment **100** may comprise a plurality of locations and a plurality of transactions associated with the trade of products between a plurality of entities.

As shown in FIG. **1**, the environment **100** may comprise locations **110**, **120**, and **130**. Each of the locations may correspond to the source or destination associated with the shipment and/or receiving of a product. For example, the location **110** may be associated with the origination or source of a product and a transaction **115** may comprise the shipment of the product from the location **110** to the location **120**. As such, the location **120** may comprise the destination associated with the transaction **115**. In some embodiments, the transaction **115** may be associated with one or more entities. For example, the transaction **115** may be associated with a vendor (e.g., a supplier or manufacturer of the product), broker, customer, etc. As such, a vendor of the product at the location **110** may ship a product to a broker at the location **120** as the transaction **115**. In some embodiments, the location **120** may also be the source for a transaction **125**. For example, an entity associated with the destination of transaction **115** may further ship the product to another entity at a location **130**. As such, the transaction of a product from the location **110** to a final destination at location **130** may comprise a plurality of transactions (e.g., sub-transactions) **115** and **125** and a plurality of entities (e.g., a shipper at location **110**, a receiver and shipper at location **120**, a receiver at location **130**, etc.).

In some embodiments, each of the transactions **115** and **125** to ship a product from the location **110** to the location **130** may require import and/or export compliance information. For example, information regarding the product being shipped, shipping information, customs information, and other import and export compliance information may need to be kept and/or sent to other entities. Furthermore, in some embodiments, each of the locations **110**, **120**, and **130** may be associated with a plurality of databases. For example, location **110** may be associated with databases **111** and **112**, location **120** may be associated with databases **121** and **122**, and location **130** may be associated with databases **131** and **132**. In some embodiments, the databases may correspond to location specific information. For example, a database may comprise Harmonized Tariff Schedule (HTS) codes for a particular country, product catalog information of a shipper or receiver, or any other database comprising information necessary for completing a transaction.

As is evident from the above discussion, a transaction of a product may be associated with a plurality of sub-transactions, entities, locations, and databases. Organizing such information and facilitating access to the information for entities in the transaction chain of the environment **100** may require a coordinated and complicated workflow. Systems and methods to facilitate the workflow of the environment **100** are discussed in further detail below. For example, a user platform that determines data dependencies for dynamic tiles may address the above issues. Furthermore, the user platform may aggregate data from widely dispersed and independent sources (e.g., databases **111**, **112**, **121**, **122**, **131**, and **132**) to facilitate a highly distributed transactional-based workflow management.

FIG. **2** is a block diagram of an example environment **200** for a system and/or a method for determining data dependency for dynamic tiles. In general, the environment **200** may comprise a user interface for organizing and displaying data from one or more databases.

As shown in FIG. **2**, the environment **200** may comprise a plurality of databases (e.g., database **210**, database **220**, and database **230**). In some embodiments, each of the databases **210**, **220**, and/or **230** may be independent of each other. For example, each of the databases **210**, **220**, and/or **230** may be associated with a separate administrative entity and/or a different location. In some embodiments, each of the locations may be associated with a different firewall and/or network. For example, each of the databases **210**, **220**, and/or **230** may be on a separate network and behind a separate firewall. The databases **210**, **220**, and/or **230** may further be based on and/or operated by different platforms (e.g., software applications, software operating systems, etc.). Thus, each of the databases **210**, **220**, and/or **230** may be associated with a different entity at different locations (e.g., network locations) where each of the locations comprises a different firewall and a different platform for operating the databases **210**, **220**, and/or **230**. In some embodiments, the entities associated with the databases **210**, **220**, and/or **230** may not access each of the other databases. For example, each of the databases **210**, **220**, and/or **230** may operate without knowing of or connecting with any of the other databases **210**, **220**, and/or **230**. As such, each database of the environment **200** may be considered independent of each of the other databases of the environment **200** and the databases may further be considered widely dispersed databases. For example, database **210** may be a database associated with a governmental entity, database **220** may be a database associated with an enterprise software systems of a first corporation, and database **230** may be a database associated with an enterprise software systems of a second corporation. In some embodiments, a network **240** (e.g., the Internet) may communicatively couple each of the databases **210**, **220**, and **230** to a user platform **250**. In some embodiments, the user platform **250** may comprise data groups **260**, **270**, and **280**. The user platform **250** may query one or more of the databases **210**, **220**, and/or **230** to request data from the one or more databases. For example, the user platform **250** may transmit a query to receive data from each of the databases **210**, **220**, and **230** over the network **240**. In response, each of the databases **210**, **220**, and **230** may transmit data associated with the query from the user platform **250** over the network **240** to the user platform **250**. In some embodiments, the user platform **250** may organize or structure the data received from the databases **210**, **220**, and **230**. For example, the user platform **250** may place the received data from database **210** into the data group **260**, the received data from database **220** into the data group **270**, and the received data from the database **230** into the data group **280**. As such, the user platform **250** may be aware of where a specific received and stored data originates from among the databases **210**, **220**, and **230**. In some embodiments, the data from the databases **210**, **220**, and **230** may be organized by the user platform **250** into dynamic tiles. Furthermore, data dependencies from the received data from the database **210**, **220**, and **230** may be identified. Further details with regard to such organization of data into dynamic tiles and identification of data dependencies are discussed in further detail below.

FIG. **3** is a flow diagram of an example method **300** for determining data dependencies for dynamic tiles in accordance with some embodiments. In general, the method **300** may update a data field in response to a modification of a data field by using data dependencies associated with the modified data field.

As shown in FIG. **3**, at step **310**, the method **300** may receive data from one or more databases. For example, a user platform (e.g., user platform **250**) may request data from one or more databases (e.g., databases **210**, **220**, and/or **230**) and receive the requested data over a network (e.g., network **240**). Next, at step **320**, data dependencies may be determined or identified. For example, a user platform (e.g., user platform **250**) may determine or identify data dependencies from the data received from the one or more databases. In some embodiments, data dependency may correspond to a first data needing to be updated or a database from which the data originates needing to be queried in response to a modification of a second data. As such, the user platform may identify whether all or a portion of the data received from a first database (e.g., database **210**) is dependent upon data received from a second database (e.g., database **220**) or a third database (e.g., database **230**). Further details with regard to data dependency are discussed in further detail below.

As shown in FIG. **3**, at step **330**, a change or modification of a data field may be received. For example, a user platform (e.g., user platform **250**) may receive a notification that a data field has been modified. In some embodiments, the modification of the data field may be from a user utilizing a user interface of the user platform or from a change to data stored on the database **210**, **220**, and/or **230**. For example, a user may manually modify a data field by utilizing the user interface of the user platform or an administrator or other user of the database **210**, **220**, and/or **230** may modify data stored on the database and the user platform may receive a notification or identify that such data has been modified (e.g., after querying the database). In some embodiments, a modification to a data field may result in the user platform to verify or check data fields that are dependent upon the modified data field. At step **340**, data fields may be dynamically updated based on the data dependencies. For example, a user platform (e.g., user platform **250**) may update data fields in response to a modified data field. In some embodiments, the updated data fields correspond to dependent data fields of the modified data field.

As such, data from one or more databases may be received. In some embodiments, the data may be organized into dynamic tiles, as further discussed below. In the same or alternative embodiments, the data may be displayed in data fields. Data dependencies between data fields may be determined. In some embodiments, a modification to a data field may result in the dynamic updating of a second data field if the second data field is dependent upon the modified data field.

FIG. **4** depicts an example data table **400** comprising data fields in accordance with some embodiments of the present disclosure. In general, the data table **400** may comprise a plurality of entries, each entry comprising a plurality of data fields. In some embodiments, a user platform (e.g., user platform **250**) may comprise or use the data table **400**.

As shown in FIG. **4**, the data table **400** may comprise a plurality of data entries **405**. In some embodiments, each of the data entries **405** may further comprise data fields corresponding to a plurality of types of data. For example, each data entry **405** may comprise data corresponding to data columns **431**, **432**, **433**, **434**, **435**, and **436**. In some embodiments, each of the data entries **405** may correspond to an item relating to import and/or export compliance. However, the example as shown in FIG. **4** is merely for exemplary purposes and is not intended to be limited to the data or types of data as show with regard to data columns **431**, **432**, **433**, **434**, **435**, and/or **436**. Furthermore, the example as shown in FIG. **4** is not intended to be limited to import and/or export compliance workflows as such an example is for illustrative purposes. As such, a data table comprising data entries, some of which may be data dependent, may be used for other types of workflows outside of the scope or use of import and/or export compliance.

As shown in FIG. **4**, the data column **431** may comprise data identifying a data entry reference identification, data column **432** may comprise data corresponding to a sender, data column **432** may comprise data corresponding to a receiver, data column **434** may comprise data corresponding to a destination, data column **435** may comprise data corresponding to a product, and data column **436** may comprise data corresponding to a product code. As such, the data table **400** comprises a plurality of entries where each of the entries comprises a plurality of data fields. In some embodiments, a user platform (e.g., user platform **250**) may organize data received from a plurality of databases (e.g., databases **210**, **220**, and/or **230**) into the data table **400**. For example, the data columns **432**, **433**, **434**, and/or **435** may be associated with a first database (e.g., data received from database **210**) and the data column **436** may be associated with a second database (e.g., data received from database **220**). As such, the data table **400** may represent data received from a plurality of databases. In some embodiments, the user platform may determine data dependencies of the data fields of the data table **400**. For example, the user platform may determine that the data fields from data column **432** and the data fields from the data column **433** are not dependent upon each other. For example, the user platform may determine that the data field **410** and the data field **411** are independent of each other such that a change or modification of the data field **410** does not need to result in the updating or querying with respect to data field **411**. In the same or alternative embodiments, the user platform may determine that the data fields from the data column **435** and the data fields from the data column **436** are dependent upon each other. For example, the user platform may determine that data field **420** and data field **421** are dependent upon each other. In some embodiments, the dependency of data fields may be that if one of the data fields has been modified, then the modification may necessitate the updating and/or querying of information of the second (e.g., not modified) data field. For example, as illustrated, a change of a product from the data field **420** may result in the change of a product code from data field **436**. As such, if a user or system modifies the data field **420**, then the data field **421** may automatically be updated in response to the modification of the data field **420**.

FIG. **5** is a block diagram of an example environment **500** using a data engine for determining data dependencies for dynamic tiles. In general, the data engine of the environment **500** may determine and dynamically manage data fields based on data dependencies between the data fields.

As shown in FIG. **5**, the environment **500** may comprise a plurality of databases. For example, the environment **500** may comprise a database **210**, database **220**, and database **230**. In some embodiments, each of the databases may be independent. For example, each database may be administered by a separate entity. Furthermore, the database **210**, database **220**, and database **230** may be communicatively coupled to a data engine **510** by a network **240**. In some embodiments, a user platform (e.g., user platform **250**) may comprise the data engine **510**. In the same or alternative embodiments, the data engine **510** may determine or identify data dependencies from data received from the database **210**, database **220**, and database **230**. For example, the data engine **510** may receive an input from a user that some portion or all of the data from a first database may be associated with or dependent upon another portion or all of the data from a second database. In the same or alternative embodiments, the data engine **510** may further retrieve data from the databases **210**, **220**, and **230**. For example, the databases may transmit data to the data engine **510** (e.g., as illustrated from path **530**). The data engine **510** may then organize the received data from the databases **210**, **220**, and **230** (e.g., based on a schema using table **400**). For example, the data engine **510** may organize the received data into a plurality of data fields. In some embodiments, each of the data fields may comprise data received from a single database **210**, **220**, or **230**. As such, the data engine **510** may indicate dependency between the data fields. For example, the data engine **510** may indicate data dependencies of the data fields of the data table **400** and dynamically update the data fields of the data table **400** based on the data dependencies when a data field is modified.

In some embodiments, the data engine **510** may be associated with permission (e.g., access or update permission) to update one or more of the databases **210**, **220**, and **230**. For example, the path **520** may be associated with transmitting data from the database **210** to the data engine **510**, where the data may populate at least one of the data fields of the data table **400**. In some embodiments, the data engine may modify (e.g., in response to a user input) one of the data fields where the data from the database **210** has been populated. As such, the data engine **510** may transmit the data from the modified data field to the database **210** so that the database **210** may be updated to reflect the modified data.

FIG. **6** is a flow diagram illustrating an example method **600** for using data dependencies to query one or more databases in response to a change of a data field in accordance with some embodiments. In general, the method **600** may be used to dynamically update one or more data fields in response to a modification of another data field. In some embodiments, a data engine (e.g., data engine **510**) may perform one or more of the steps of the method **600**.

As shown in FIG. **6**, the method **600** may receive, at step **610**, data from one or more databases. For example, the data engine may receive data from a plurality of databases (e.g., database **210**, **220**, and/or **230**). At step **620**, the receive data may be organized into data fields in dynamic tiles. For example, the data may be organized into a plurality of data fields where each data field is associated with data from a single database. Further details with regard to the organization of the data into dynamic tiles are further discussed below in association with FIG. **7**. At step **630**, a modification to a data field may be received. For example, a modification or change to a data field of a dynamic tile may be received from a user. Furthermore, at step **640**, data fields that are dependent upon the modified data field may be identified. For example, a data engine (e.g., data engine **510**) may identify or have previously identified or received information to indicate which data fields are dependent with other data fields. As such, the data engine may determine or identify the data fields that are dependent upon the data field that has been modified. Thus, the specific one or more data fields from a plurality of data fields that are associated or dependent upon the modified data field are identified. At step **650**, databases that are associated with the dependent data fields (e.g., data fields that are dependent or associated with the modified data field) may be queried. For example, databases (e.g., databases **210**, **220**, and/or **230**) may be queried if a data field is populated with data originally from the database (e.g., data transmitted from the database to the data engine and/or user platform in response to a query). In some embodiments, each data field may be associated with a single database. As such, if a plurality of data fields is dependent or associated with the modified data field, then a plurality of databases may be queried in response to the modification of the data field. For example, in some embodiments, a first data field may be modified. In the same or alternative embodiments, the first data field may be associated with a second data field and a third data field. In some embodiments, the modification of the first data field may necessitate the updating of data of the second data field and the third data field (e.g., the second data field and the third data field are dependent upon the first data field). Furthermore, the second data field may be associated with a first database (e.g., the second data field was originally populated with data retrieved from the first database) and the third data field may be associated with a second database (e.g., the third data field was originally populated with data retrieved from the second database). As such, in order to update the second data field and the third data field in response to the modification of the first data field, the first database and the second database may need to be queried. For example, the first database may be queried to retrieve new data for the second data field and the second database may be queried to retrieve new data for the third data field. In some embodiments, the querying of the first database and the second database may be based on the modification of the first data field and/or the type of data comprised within the second data field and/or third data field. For example, in some embodiments, a product field may comprise an identification of a first product. If the product data field is changed or modified (e.g., a user changes the product data field to indicate a second product instead of the first product), then dependent data fields, such as a product code data field and a product supplier data field, may be need to be updated in response to the modification of the product data field from an identification of the first product to an identification of the second product as the product code and the product supplier for the second product may differ from the product code and the product supplier of the first product. In some embodiments, the product code data field may be associated with a product code database and the product supplier data field may be associated with a product supplier database. In the same or alternative embodiments, each of the product code database and the product supplier database may be administered by distinct or separate entities. For example, each of the product code database and the product supplier database may be associated with a different administrator, be associated with different permissions, and comprise different locations (e.g., network locations). As such, in response to the modifying of the product data field, a plurality of databases may be queried. Furthermore, the querying of each of the databases may be dependent upon the modification of the product data field and the dependent data field. For example, the query for the product code database may request a new product code for the second product (e.g., as indicated in the product data field) and a query for the product supplier database may request a new product supplier for the second product. Moreover, at step **660**, the method **600** may update the dependent data fields of dynamic tiles with the data received from the query of step **650**. For example, dependent data fields may be updated to reflect the change of a modified data field.

FIG. **7** depicts an example user interface **700** comprising dynamic tiles in accordance with some embodiments. In general, the user interface **700** may comprise a plurality of dynamic tiles for displaying information from a plurality of disparate sources (e.g., databases **210**, **220**, and/or **230**) and information from a plurality of entities to facilitate a transaction (e.g., transactions **115** and **125**). Furthermore, the user interface **700** may comprise an online application (including data engine **510**) that runs within a web browser and capable of being accessed over a network (e.g., network **240**) by one or more entities or users.

As shown in FIG. **7**, the user interface **700** may comprise a selection tile **710** allowing a user (e.g., an entity as previously discussed) to select one or more products. For example, the selection tile **710** may comprise entries **711**, **712**, and **713**. In the example provided, the user interface **700** corresponds to a selection of a product. However, the user interface **700** may be used for other purposes and the example of a product and product information is merely provided as an example. In some embodiments, each of the entries **711**, **712**, and **713** corresponds to a single product. For example, entry **711** is a 'Grapple Camera Tripod.' The entry **711** displays a plurality of entry fields comprising information relating to the product. Furthermore, in some embodiments, the selection of the entry **711** enables the display of a plurality of dynamic tiles. For example, if a user clicks on the entry **711**, the user interface **700** may display dynamic tiles **715**, **720**, **730**, **735**, **740**, **745**, **750**, **760**, and/or **770**. In some embodiments, each of the dynamic tiles comprises one or more data fields that display information from one or more databases. As such, the organization of data from widely dispersed databases, as previously discussed, may be based on the use of the dynamic tiles of the user interface **700**. In some embodiments, the dynamic tile **715** may comprise product identifier data fields (e.g., product title, product SKU number, product family, manufacturer, product description, user platform identification), the dynamic tile **720** may comprise product parts data fields, the dynamic tile **730** may comprise manufacturer data fields (e.g., identification of the manufacturer, country of origin, suppliers of the product), and the dynamic tile **735** may comprise data fields regarding the dimensions (e.g., unit of measurement, shipping weight, length, width, height, etc.) of the product (e.g., the 'Grapple Camera Tripod'). In some embodiments, a dynamic tile **740** may comprise HTS codes for a plurality of countries for the product, the dynamic tile **745** may comprise data fields for Export Control Classification Number (ECCN) codes for one or more countries, dynamic tile **750** may comprise data fields for pricing information, dynamic tile **760** may comprise data fields for import licenses associated with the product, and dynamic tile **770** may comprise data fields for export licenses associated with the product. Although specific types of dynamic tiles are disclosed above, any type of information may be organized into the data fields of the dynamic tiles.

In some embodiments, the selection of a different entry (e.g., entry **712** and/or **713**) may result in the dynamic changing of the dynamic tiles. For example, if a user has selected entry **711**, the dynamic tiles may display data fields associated with the product of entry **711**. However, if the user clicks on the entry **712**, the dynamic tiles may automatically update to reflect the data fields associated with the product of entry **712**. In some embodiments, the updating may be performed on the same page without any reloading. For example, the clicking on the entries **711**, **712**, or **713** may be enabled such that a webpage comprising the user interface **700** does not reload in response to each click of an entry. Instead, the dynamic tiles may be updated immediately on the user interface on the webpage without reloading the webpage. Furthermore, the clicking from one entry to another in the user interface **700** may result in the dynamic querying of one or more databases. For example, if a user clicks on entry **711**, a plurality of databases may be queried for information regarding the product of the entry **711**. Received information may be organized into the data fields of the dynamic tiles. Next, if a user clicks on the entry **713**, the plurality of databases may be queried again for information regarding the product of the entry **713**. The new information regarding the product of the entry **713** may also be organized into the data fields of the dynamic tiles.

Furthermore, a user may update or modify the dynamic tiles. For example, the user may modify a data field of the dynamic tiles of the user interface **700**. In some embodiments, the modification of one of the data fields of a dynamic tile of the user interface **700** may be associated with the method **300** of FIG. **3** and the method **600** of FIG. **6**.

In some embodiments, the dynamic tiles as shown in FIG. **7** may each display a portion of a database associated with the user interface **700**. For example, each of the dynamic tiles of the user interface **700** may display one or more data fields that have been received and organized from a plurality of databases (e.g., database **210**, **220**, and/or **230** as disclosed with relation to step **620** of FIG. **6**, etc.). In some embodiments, each of the dynamic tiles may be associated with a query. For example, the dynamic tile **715** may be associated with a first query for the database associated with the user interface **700** and the dynamic tile **720** may be associated with a second query for the database associated with the user interface **700**. In some embodiments, the queries for each of the dynamic tiles are a query for the data associated with the data fields of the dynamic tiles. For example, the query for dynamic tile **715** may request data associated with data fields for the product title, product SKU number, manufacturer, and user platform ID and the query for dynamic tile **720** may request data associated with the data field for HTS codes. In some embodiments, the queries for the dynamic tiles are executed or run whenever a data field of the user interface **700** (e.g., a data field displayed by a dynamic tile) is modified or a selection is made (e.g., a selection of entry **711**, **712**, and/or **713**) in the user interface **700**. As such, the dynamic tiles may respond to any change or input to the user interface **700**. In some embodiments, the dynamic tiles may automatically update (e.g., reflect new data in the data fields) without refreshing a webpage comprising the user interface **700**.

As such, an application program (e.g., an Internet application executing the user interface **700** on a webpage) may determine data dependency for dynamic tiles. In some embodiments, the data dependency of data fields may result in the execution of queries to external (e.g., widely dispersed) databases in response to a modification of a data field. Furthermore, the dynamic tiles may each be associated with a view of particular data of a database comprising organized information from a plurality of external databases. In some embodiments, the dynamic tiles may execute a query to the database in response to a change or user selection of a data field or entry of the user interface **700**. As such, a user does not have to input a query as the dynamic tiles may automatically execute a query in response to the change of a data field or the user selection of an entry.

The above disclosure may facilitate a plurality of transactional-based environments. For example, although the above disclosure generally relates to import and export compliance, the user interfaces, methods, and systems may also be used to facilitate other such transactional-based workflows such as a healthcare workflow (e.g., a plurality of doctors and an insurance adjuster facilitating a transaction involving a patient).

FIG. **8** depicts a diagram illustrating a network **800** for execution of the operations comprising various embodiments of the disclosure. The diagrammatic representation of the network **800**, including nodes for client computer systems **802**$_1$ through **802**$_N$, nodes for server computer systems **804**$_1$ through **804**$_N$, nodes for network infrastructure **806**$_1$ through **806**$_N$, any of which nodes may comprise a machine **850** within which a set of instructions for causing the machine to perform any one of the techniques discussed above may be executed. The embodiment shown is purely exemplary, and might be implemented in the context of one or more of the figures herein.

Any node of the network **800** may comprise a general-purpose processor, a digital signal processor (DSP), an application specific integrated circuit (ASIC), a field programmable gate array (FPGA) or other programmable logic device, discrete gate or transistor logic, discrete hardware components, or any combination thereof capable to perform the functions described herein. A general-purpose processor may be a microprocessor, but in the alternative, the processor may be any conventional processor, controller, microcontroller, or state machine. A processor may also be implemented as a combination of computing devices (e.g. a combination of a DSP and a microprocessor, a plurality of microprocessors, one or more microprocessors in conjunction with a DSP core, or any other such configuration, etc.).

In alternative embodiments, a node may comprise a machine in the form of a virtual machine (VM), a virtual server, a virtual client, a virtual desktop, a virtual volume, a network router, a network switch, a network bridge, a personal digital assistant (PDA), a cellular telephone, a web appliance, or any machine capable of executing a sequence of instructions that specify actions to be taken by that machine. Any node of the network may communicate cooperatively with another node on the network. In some embodiments, any node of the network may communicate cooperatively with every other node of the network. Further, any node or group of nodes on the network may comprise one or more computer systems (e.g. a client computer system, a server computer system) and/or may comprise one or more embedded computer systems, a massively parallel computer system, and/or a cloud computer system.

The computer system **850** includes a processor **808** (e.g. a processor core, a microprocessor, a computing device, etc.), a main memory **810** and a static memory **812**, which communicate with each other via a bus **814**. The machine **850** may further include a display unit **816** that may comprise a touch-screen, or a liquid crystal display (LCD), or a light emitting diode (LED) display, or a cathode ray tube (CRT). As shown, the computer system **850** also includes a human input/output (I/O) device **818** (e.g., a keyboard, an alphanumeric keypad, etc.), a pointing device **820** (e.g., a mouse, a touch screen, etc.), a drive unit **822** (e.g. a disk drive unit, a CD/DVD drive, a tangible computer readable removable media drive, an SSD storage device, etc.), a signal generation device **828** (e.g. a speaker, an audio output, etc.), and a network interface device **830** (e.g. an Ethernet interface, a wired network interface, a wireless network interface, a propagated signal interface, etc.).

The drive unit **822** includes a machine-readable medium **824** on which is stored a set of instructions (i.e. software, firmware, middleware, etc.) **826** embodying any one, or all, of the methodologies described above. The set of instructions **826** is also shown to reside, completely or at least partially, within the main memory **810** and/or within the processor **808**. The set of instructions **826** may further be transmitted or received via the network interface device **830** over the network bus **814**.

It is to be understood that embodiments of this disclosure may be used as, or to support, a set of instructions executed upon some form of processing core (such as the CPU of a computer) or otherwise implemented or realized upon or within a machine- or computer-readable medium. A machine-readable medium includes any mechanism for storing information in a form readable by a machine (e.g. a computer). For example, a machine-readable medium includes read-only memory (ROM); random access memory (RAM); magnetic disk storage media; optical storage media; flash memory devices; electrical, optical or acoustical or any other type of media suitable for storing information.

FIG. **9** depicts an example dynamic data platform system **900** for determining data dependency of dynamic tiles. In general, the dynamic data platform system **900** may comprise a data field manager **910** for performing the methods associated with determining data dependency as disclosed herein.

As shown in FIG. **9**, the data field manager **910** may comprise a data fields module **920**, dependency module **930**, and a data field update module **940**. In some embodiments, the data field manager **910** may receive database data **950** and modification data **960**. For example, the database data **950** may be information from one or more databases that has been organized into dynamic tiles as previously discussed. Furthermore, the modification data **960** may comprise a change to the database data **950** after it has been received by the data field manager **910**. In some embodiments, the data fields module **920** may store the database data **950** and the dependency module **930** may determine the dependencies between the data fields of the data fields module **920**. Furthermore, the data field update module **940** may request an update to data from a database in response to the modification data **960**. For example, the data field update module **940** may issue an output request **970** to one or more databases in response to the modification data **960**.

What is claimed is:

1. A method to display data, the method comprising:

displaying, using at least one computer, as a first component of a user interface, a selection tile comprising a plurality of entries such that each entry is associated with a data set;

organizing, using the computer, for each entry, a plurality of dynamic tiles to display data associated with a corresponding data set of an entry, wherein each dynamic tile comprises one or more data fields of the data set;

receiving, using the computer, a first selection of a first entry displayed in the selection tile;

receiving, using the computer, data associated with the data set for the first entry;

displaying, using the computer, as a second component of the user interface, the received data within the data fields of the dynamic tiles associated with the first entry;

receiving, using the computer, a second selection of a second entry displayed in the selection tile;

receiving, using the computer, data associated with the data set for the second entry; and

displaying, using the computer, as the second component of the user interface, the received data within data fields of the dynamic tiles associated with the second entry, wherein the dynamic tiles associated with the first entry are different from the dynamic tiles associated with the second entry.

2. The method of claim **1**, further comprising identifying, using the at least one computer, a dependency between a first data field and a second data field of the plurality of data fields, wherein the dependency between the first data field and the second data field of the plurality of data fields comprises an indication that a modification to the first data field requires an updating of the second data field.

3. The method of claim **2**, wherein the modification comprises a change made to the data in the first data field, wherein the second data field is associated with a second database, wherein after the change the second database is no longer up to date, and the method further comprises: updating, using a computer, the second database based on the dependency and the modification.

4. The method of claim **1**, further comprising:

displaying, the at least one computer, a plurality of dynamic tiles based on a user selection of a first entry, wherein a first dynamic tile comprises at least one of the data fields and is associated with a first query;

receiving, using the at least one computer, a user selection of a second entry; and

executing, the at least one computer, the first query associated with the first dynamic tile in response to the user selection.

5. The method of claim **4**, wherein the execution of the first query is performed without a user input of a query, the method further comprising:

displaying, using the at least one computer, the first dynamic tile with at least one updated data field in response to the execution of the first query, wherein the at least one updated data field is at least partly based on the user selection of the second entry.

6. The method of claim **1**, wherein the first data field is associated with the first database and a second data field is associated with a second database, the updating of the second data field results in the querying of the second database based on the modification of the first data field.

7. The method of claim **6**, wherein the first database and the second database are independent of each other such that the first database and the second database are associated with different locations and different administrators.

8. A non-transitory computer readable medium carrying one or more instructions to display data, wherein the one or more instructions, when executed by one or more processors, causes the one or more processors to perform the steps of:

displaying, as a first component of a user interface, a selection tile comprising a plurality of entries such that each entry is associated with a data set;

organizing, for each entry, a plurality of dynamic tiles to display data associated with a corresponding data set of an entry, wherein each dynamic tile comprises one or more data fields of the data set;

receiving, a first selection of a first entry displayed in the selection tile;

receiving data associated with the data set for the first entry;

displaying, as a second component of the user interface, the received data into the data fields of the dynamic tiles associated with the first entry;

receiving a second selection of a second entry displayed in the selection tile;

receiving data associated with the data set for the second entry; and

displaying, as the second component of the user interface, the received data into data fields of the dynamic tiles associated with the second entry wherein the dynamic tiles associated with the first entry are different from the dynamic tiles associated with the second entry.

9. The non-transitory computer readable medium of claim **8**, wherein the steps further comprise identifying a dependency between a first data field and a second data field of the plurality of data fields, wherein the dependency between the first data field and the other data fields second data field of the plurality of data fields comprises an indication that a modification to the first data field requires an updating of the second data field.

10. The non-transitory computer readable medium of claim **9**, wherein the modification comprises a change made to the data in the first data field, wherein the second data field is associated with a second database, wherein after the change the second database is no longer up to date, and the steps further comprise: updating the second database based on the dependency and the modification.

11. The non-transitory computer readable medium of claim **8**, wherein the steps further comprise:

displaying a plurality of dynamic tiles based on a user selection of a first entry, wherein a first dynamic tile comprises at least one of the data fields and is associated with a first query;

receiving a user selection of a second entry; and

executing the first query associated with the first dynamic tile in response to the user selection.

12. The non-transitory computer readable medium of claim **11**, wherein the execution of the first query is performed without a user input of a query, the steps further comprise:

displaying the first dynamic tile with at least one updated data field in response to the execution of the first query, wherein the at least one updated data field is at least partly based on the user selection of the second entry.

13. The non-transitory computer readable medium of claim **8**, wherein the first data field is associated with the first database and a second data field is associated with a second database, the updating of the second data field results in the querying of the second database based on the modification of the first data field.

14. The non-transitory computer readable medium of claim **13**, wherein the first database and the second database are independent of each other such that the first database and the second database are associated with different locations and different administrators.

15. A system to display data, the system comprising: at least one processor and memory, and a non-transitory computer readable medium having thereon one or more programs, which when executed by the at least on processor, cause the system to:

display, as a first component of a user interface, a selection tile comprising a plurality of entries such that each entry is associated with a data set;

organize, for each entry, a plurality of dynamic tiles to display data associated with a corresponding data set of an entry, wherein each dynamic tile comprises one or more data fields of the data set;

receive, a first selection of a first entry displayed in the selection tile;

receive data associated with the data set for the first entry;

display, as a second component of the user interface, the received data into the data fields of the dynamic tiles associated with the first entry;

receive a second selection of a second entry displayed in the selection tile;

receive data associated with the data set for the second entry; and

display, as the second component of the user interface, the received data into data fields of the dynamic tiles associated with the second entry, wherein the dynamic tiles associated with the first entry are different from the dynamic tiles associated with the second entry.

16. The system of claim **15**, wherein the one or more programs further cause the system to identify a dependency between a first data field and a second data field of the plurality of data fields, wherein the dependency between the first data field and the second data field of the plurality of data fields comprises an indication that a modification to the first data field requires an updating of second data field.

17. The system of claim **16**, wherein the modification comprises a change made to the data in the first data field, wherein the second data field is associated with a second database, wherein after the change the second database is no longer up to date, and the one or more programs further cause the system to update the second database based on the dependency and the modification.

18. The system of claim **15**, the one or more programs further causing the system to:

display a plurality of dynamic tiles based on a user selection of a first entry, wherein a first dynamic tile comprises at least one of the data fields and is associated with a first query;

receive a user selection of a second entry; and

execute the first query associated with the first dynamic tile in response to the user selection.

19. The system of claim **18**, wherein the execution of the first query is performed without a user input of a query, the one or more programs further causing the system to:

display the first dynamic tile with at least one updated data field in response to the execution of the first query, wherein the at least one updated data field is at least partly based on the user selection of the second entry.

20. The system of claim **15**, wherein the first data field is associated with the first database and a second data field is associated with a second database, the updating of the second data field results in the querying of the second database based on the modification of the first data field.

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